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## TRANSLATION

PULSE MAGNETIC DECODER

By

I. V. Lebedev

## FOREIGN TECHNOLOGY DIVISION

AIR FORCE SYSTEMS COMMAND

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## UNEDITED ROUGH DRAFT TRANSLATION

PULSE MAGNETIC DECODER

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English Pages: 4

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Pulse Magnetic Decoder

By

I. V. Lebedev

There are known pulse magnetic decoders on two cores each of which has two input windings and one output winding.

In the proposed decoder for reducing the amount of instrumentation, increasing the efficiency, and lowering the level of interference, the input windings are connected together and with two paraphase inputs in accordance with logic formulas of decoding, and all the cores are linked together in series by a general connection winding.

In Fig. 1, there is a diagram showing the principle of the described decoder. In Fig. 2, there is a graph of the change in the magnetic state of the core during the working of the decoder.

The decoder has  $n$  paraphase inputs  $1$  and  $2^n$  outputs  $2$ . It consists of  $2^n$  cores  $3$  with a nonideal hysteresis loop through which they pass by  $n$  input bars in an order determined by the logic formulas of the decoding. Besides, all the cores are joined by one general connection winding  $4$ .

In the initial state all the cores are in one and the same state of magnetization; for example, at the point  $M$  (Fig. 2). The input pulses have

negative polarity, and in essence are prohibiting. In the decoding onto the selected core signals do not pass, onto  $n$  cores (dead) there pass one signal each, and onto the remaining ones ( $2^n - n - 1$ ) cores (working) more than one. Because of the nonideal state of the rectangular hysteresis loop of the core's material the passing of the current over the input windings brings about some change in the magnetic induction in the cores, indicated in Fig. 2 by AB. By virtue of this change in the connection winding a voltage will be produced. Although the component of the voltage from each of the working cores is not great the large number of such cores joined in series and working on one general connection winding transmits to this winding considerable power. As a result on the winding of the connection a positive voltage flows.

In  $n$  dead cores the magnetic fluxes, produced by the current of the connection winding and the current of the input winding mutually compensate each other and these cores remain unexcited. In ( $2^n - n - 1$ ) working cores a magnetic flux arises which corresponds at least to one input signal. Through the selected core there does not pass a single input prohibiting pulse. Therefore in its input winding on account of the action of the current of the connection winding there is set up a negative output pulse signal. After the suppression of the action of the input pulses the working cores return to the initial state. Meanwhile on account of the change in the magnetic induction in the connection winding there will be produced a pulse of current with the negative sign, which returns the selected core to the initial state. On the output of the selected core there appears a positive signal.

In this way the decoder gives off two-polar pulses, which makes it possible to use it for controlling magnetic operative memory devices (first half-wave is used for the reading, the second for recording the codes; in logic circuits which do not require recording the second half may be cut

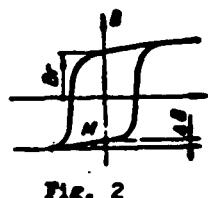
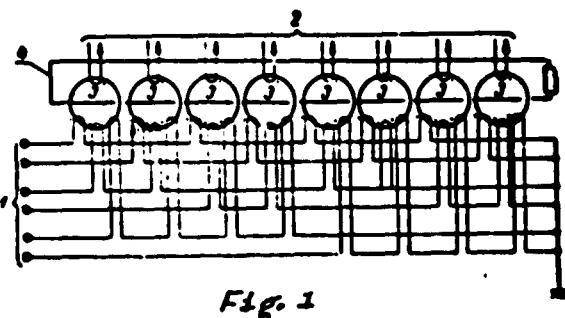
off by a diode).

The decoder described makes it possible to reduce the amount of instrumentation, since the input signal proves to be the direct result of the input code signals, and improve the efficiency, since the power is spent in the reversal of the magnetic polarity for the full hysteresis loop of only one selected core. Besides, the decoder described makes it possible to lower the level of interference.

The decoder can find application in the circuits of automation and various devices of computation machines. Besides, the decoder can be applied in address systems of various memory devices of great volume.

#### Object of the Invention

A pulse magnetic decoder on two cores, each of which has two input and one output winding, is distinguished by the fact that for the purpose of decreasing the amount of instrumentation, raising the efficiency, and lowering the level of interferences, the input windings are connected with each other and with to paraphase inputs in accordance with the logic formulas of decoding, and all the cores are linked in series by the general connection winding.



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